

FIG. 1
PRIOR ART

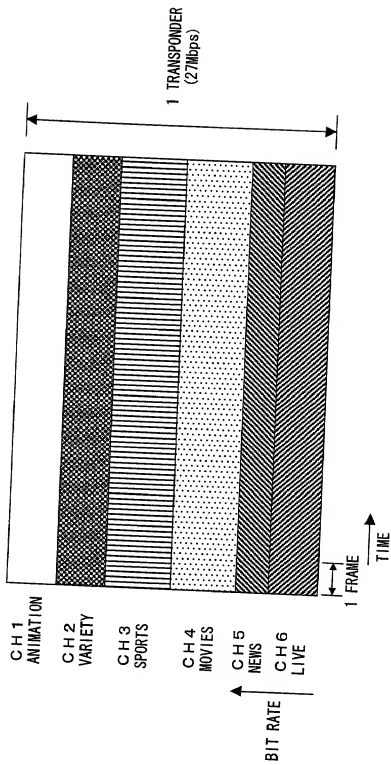


FIG. 2

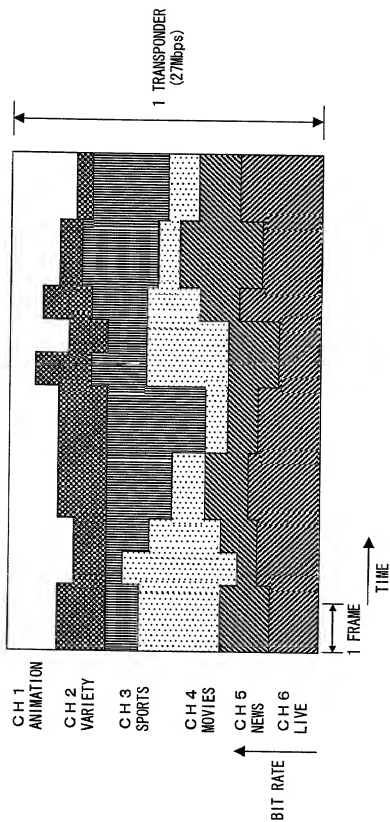


FIG. 3

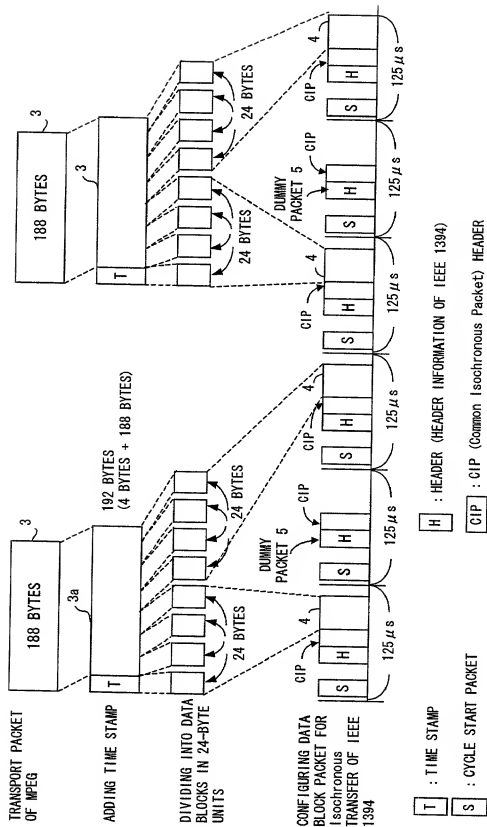


FIG. 4

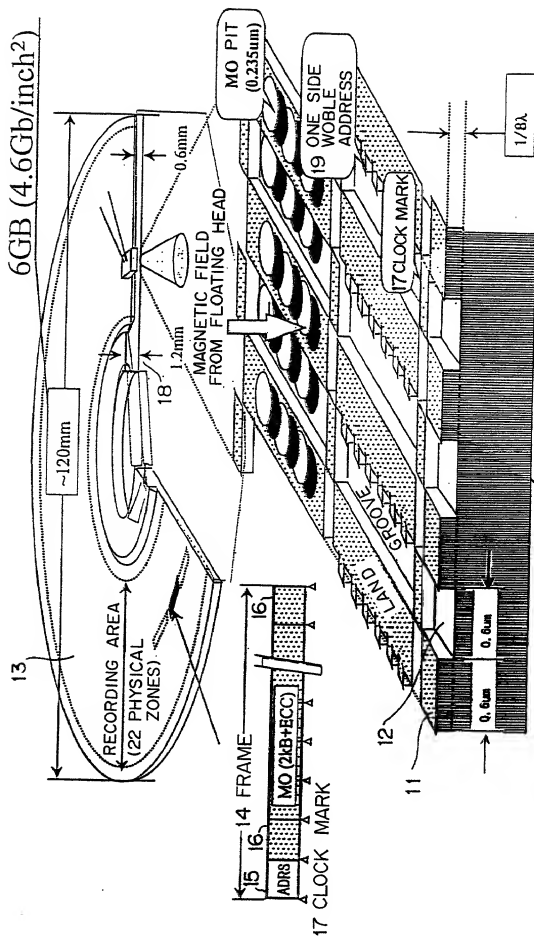


FIG. 5

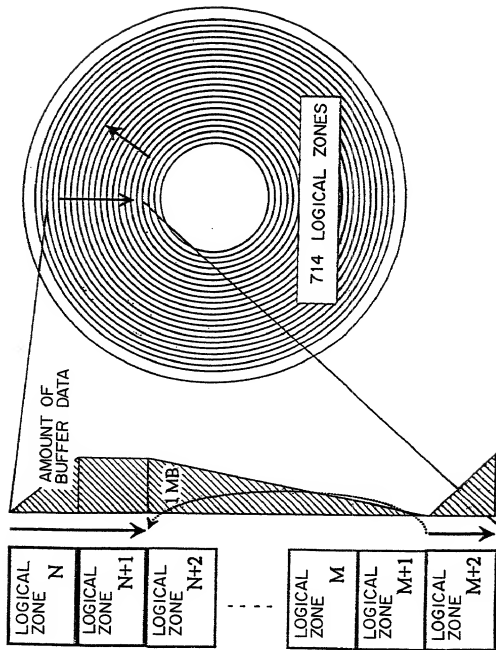


FIG. 6

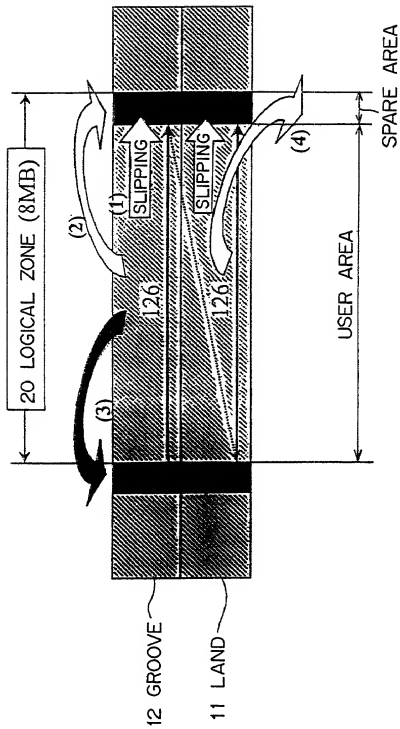


FIG. 7

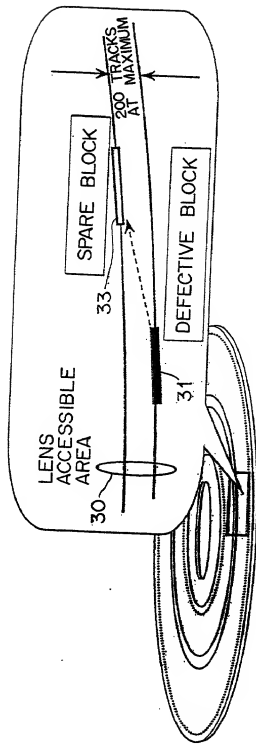


FIG. 8

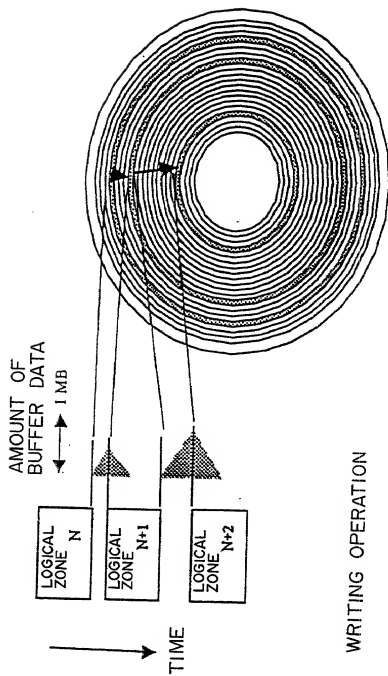


FIG. 9

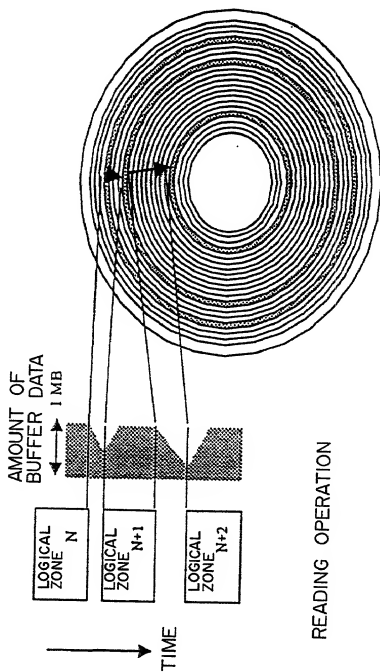


FIG. 10

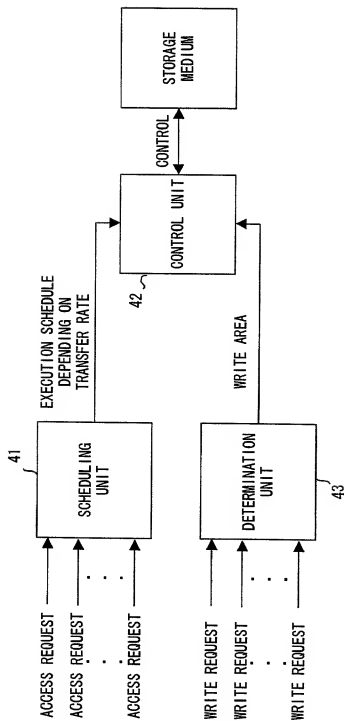


FIG. 11

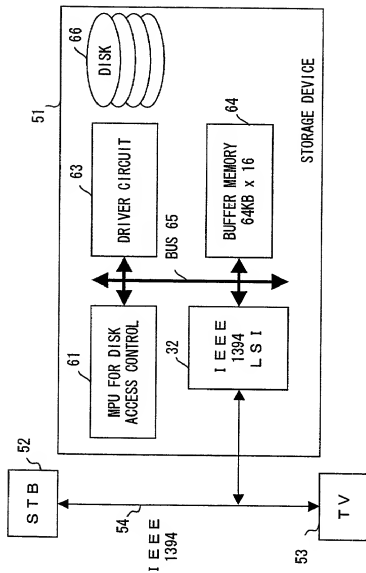


FIG. 12

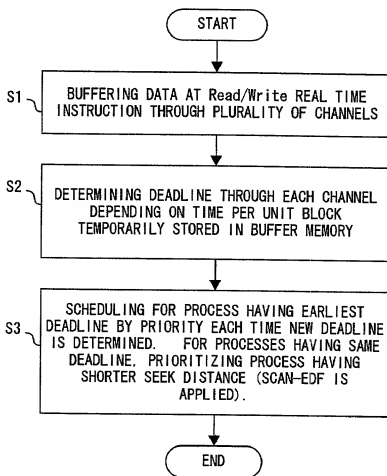


FIG. 13

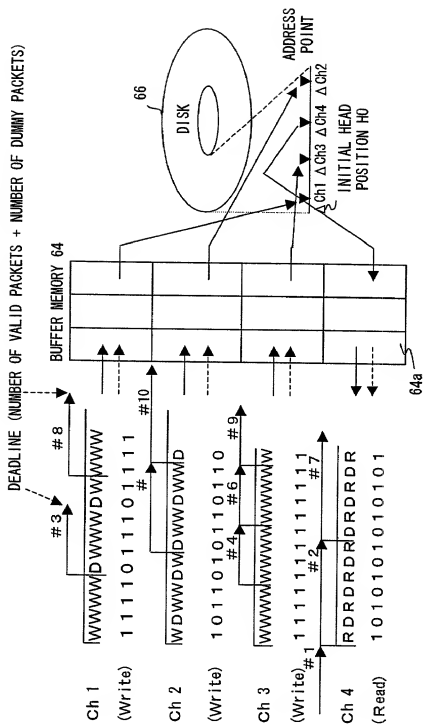


FIG. 14

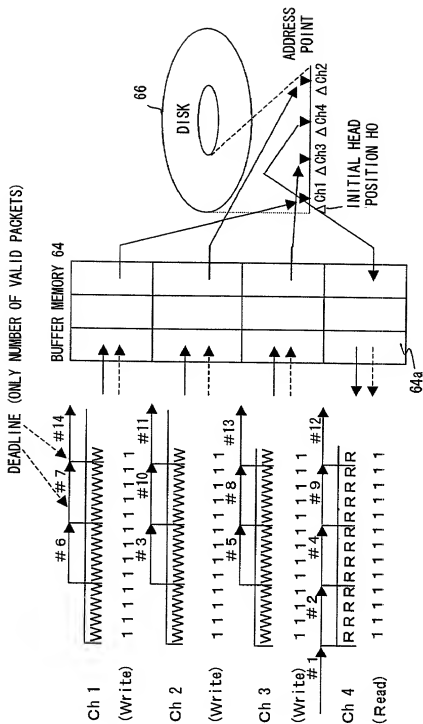


FIG. 16

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S

PROCESS ORDER	DEADLINE T	R/W	CHANNEL C	BLOCK ADDRESS A ON DISK
1	T_i	W_i	C_i	A_i
.
.
m-1	T_j	R_j	C_j	A_j
REGISTRATION → m	T_k	R_k	C_k	A_k
.
.
2N				

Order (1) = {T, R/W, C, A}

FIG. 17

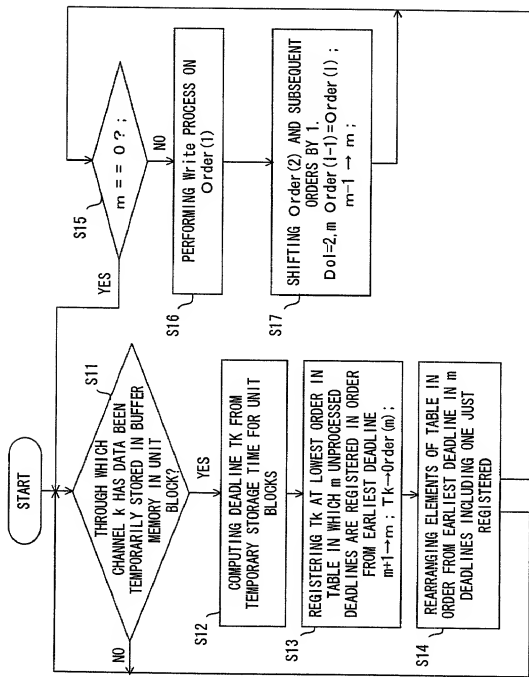


FIG. 18

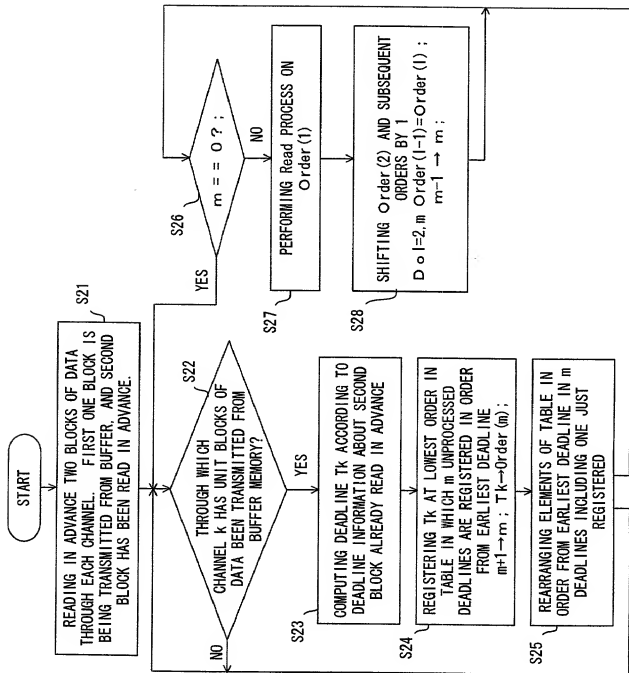


FIG. 19

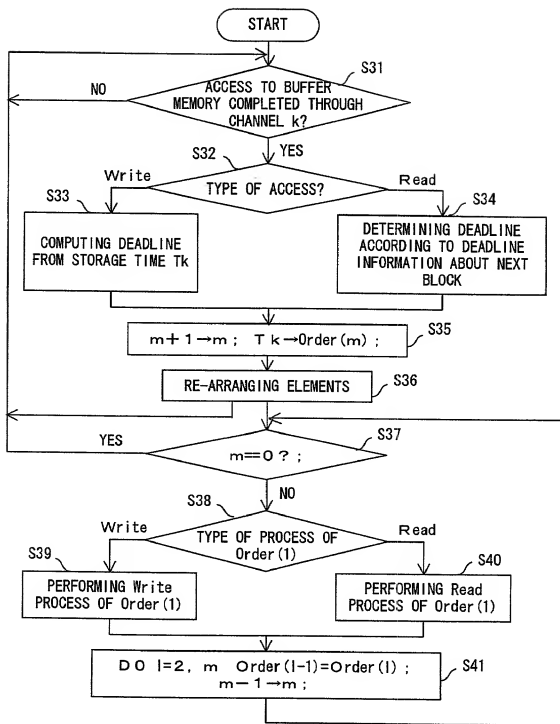


FIG. 20

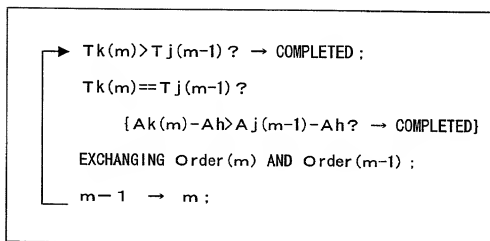


FIG. 21

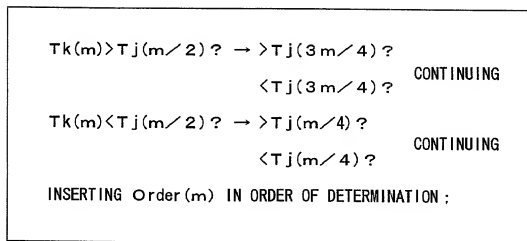


FIG. 22

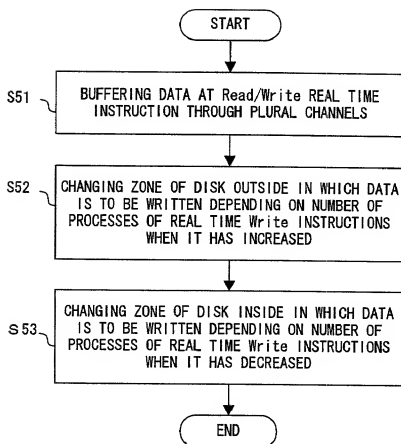


FIG. 23

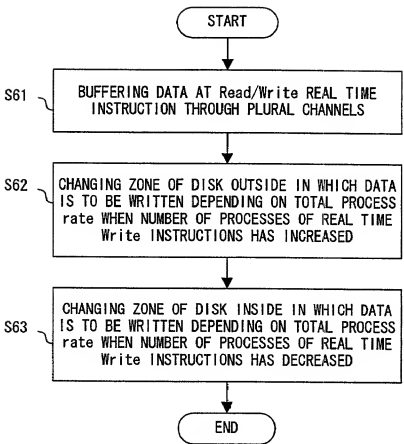
[illegible]

FIG. 24

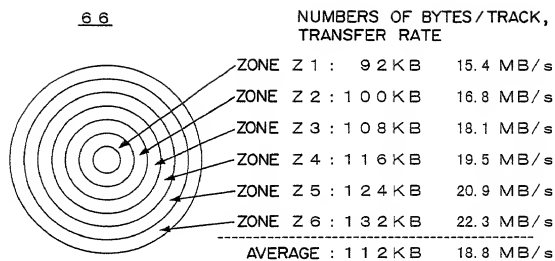
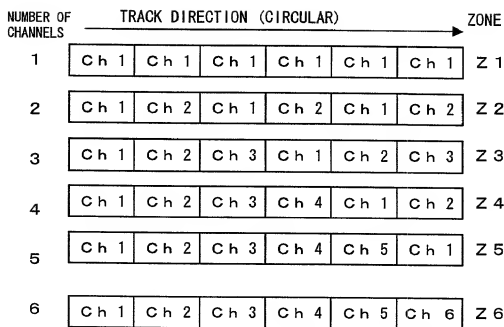


FIG. 25



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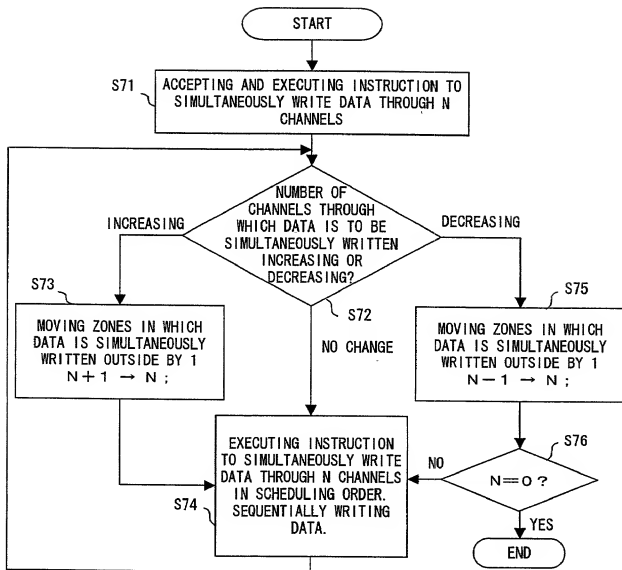


FIG. 27

```

graph TD
    START([START]) --> S81[S81: BUFFERING DATA AT REAL TIME write INSTRUCTION THROUGH PLURAL CHANNELS]
    S81 --> S82[S82: WRITING BLOCK DATA FOR PLURAL NUMBER OF PROCESSES OF REAL TIME write INSTRUCTION CONTINUOUSLY IN ONE ZONE]
    S82 --> S83[S83: MOVING HEAD TO OTHER ZONE IN PAIR OF ZONES]
    S83 --> S84[S84: WRITING BLOCK DATA FOR PLURAL NUMBER OF PROCESSES OF REAL TIME write INSTRUCTION CONTINUOUSLY IN OTHER ZONE]
    S84 --> S85[S85: MOVING HEAD TO OTHER ZONE IN PAIR OF ZONES]
    S85 --> S86{S86: END OF DATA?}
    S86 -- NO --> S82
    S86 -- YES --> END([END])
  
```

FIG. 28

TRACK DIRECTION
(CIRCULAR)

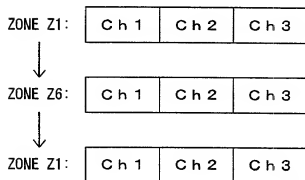


FIG. 29

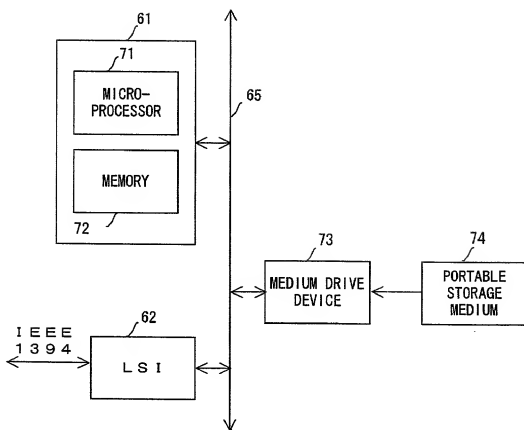


FIG. 30

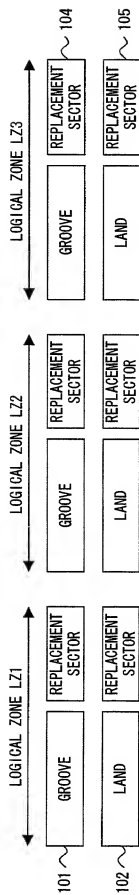


FIG. 31

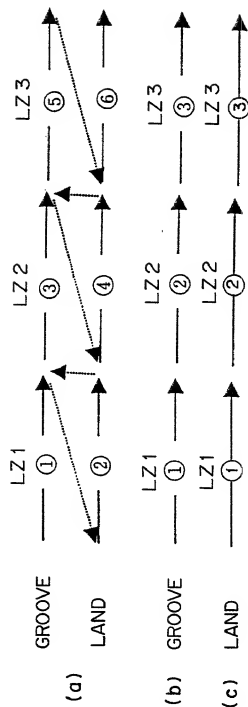


FIG. 32

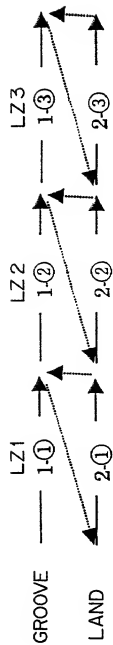


FIG. 33

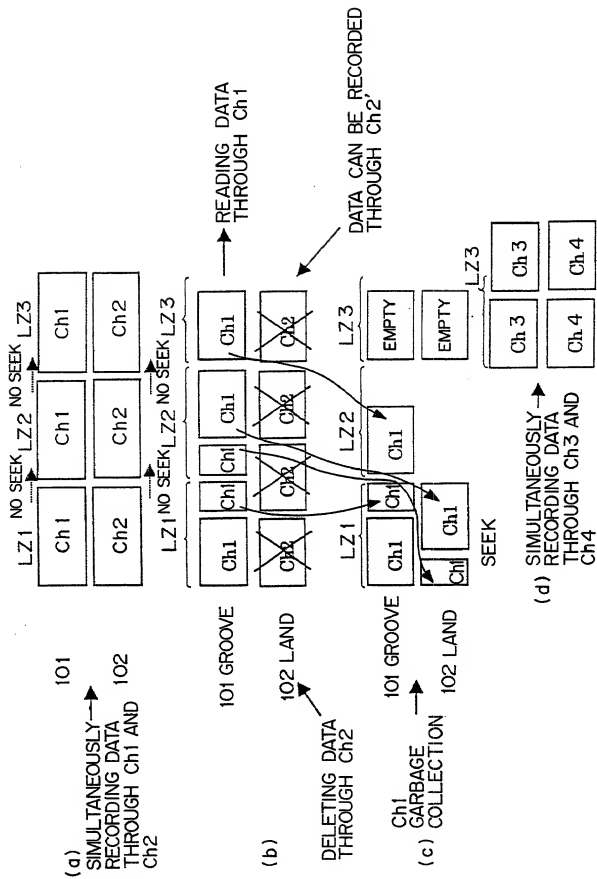


FIG. 34

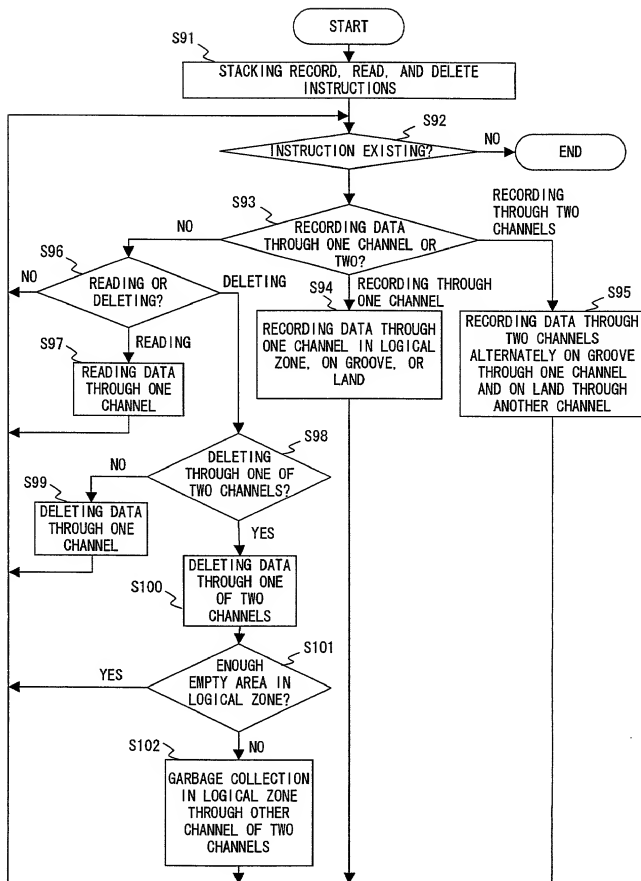


FIG. 35

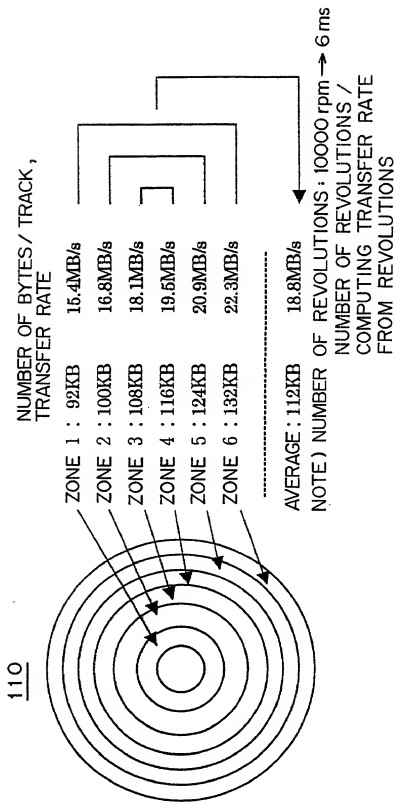


FIG. 36

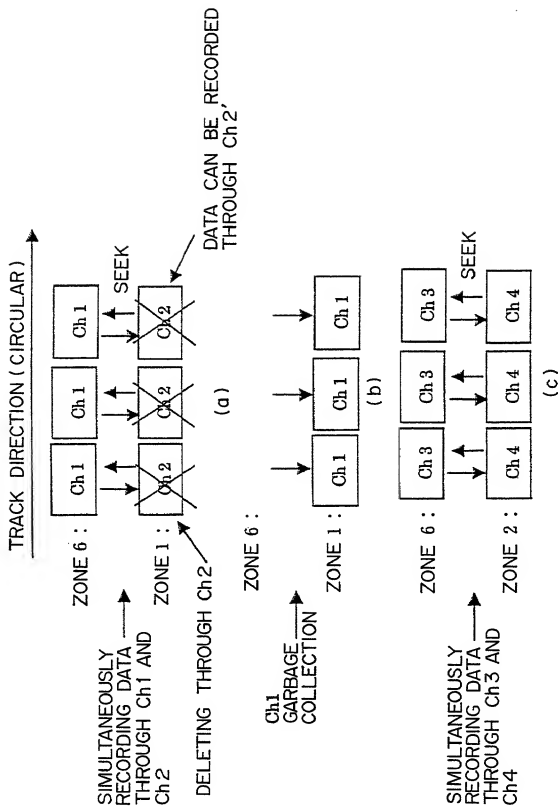


FIG. 37

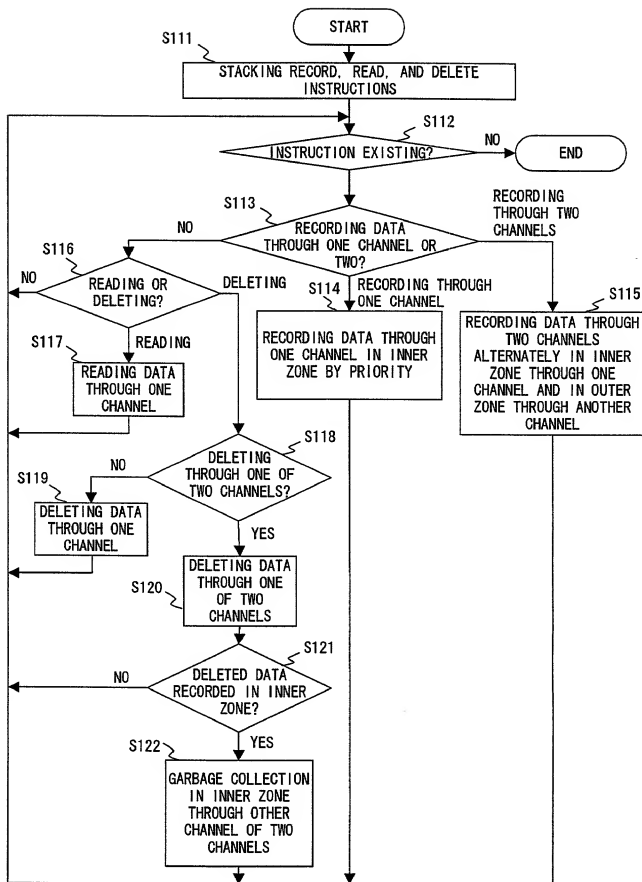


FIG. 38

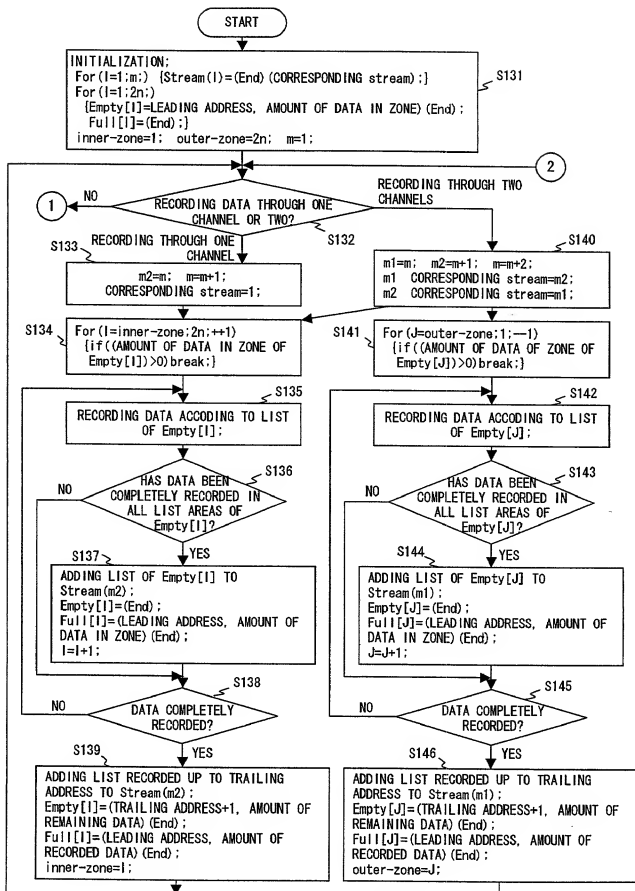


FIG. 40

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STREAM LIST	(LEADING ADDRESS, AMOUNT OF DATA) → COMPLETION, CORRESPONDING stream FOR RECORDING DATA THROUGH TWO CHANNELS
Stream(1)	(Add, Data) → (Add, Data) →.....→ End.m?
· · ·	· · ·
Stream(m)	(Add, Data) → (Add, Data) →.....→ End.m?

FIG. 41

130

INNER/ OUTER	ZONE	EMPTY/FULL LIST	(LEADING ADDRESS, AMOUNT OF DATA) → COMPLETION : LIST STRUCTURE
INNER ZONE	1	Empty[1]	(Add, Data) → (Add, Data) → → End
		Full[1]	(Add, Data) → (Add, Data) → → End
	:	:	:
	:	:	:
	n	Empty[n]	(Add, Data) → End (INITIAL VALUE)
		Full[n]	End (INITIAL VALUE)
	n+1	Empty[n+1]	(Add, Data) → End (INITIAL VALUE)
		Full[n+1]	End (INITIAL VALUE)
OUTER ZONE	:	:	:
	:	:	:
	2n	Empty[2n]	(Add, Data) → (Add, Data) → → End
		Full[2n]	(Add, Data) → (Add, Data) → → End

FIG. 42

ZONE no.	NUMBER OF BYTES/TRACK	NUMBER OF TRACKS	NUMBER OF SECTORS	SECTOR ADDRESS
1	92KB	1000	184k	1-184000
2	100KB	1000	200k	184000-384000
3	108KB	1000	216k	384001-600000
4	116KB	1000	232k	600001-832000
5	124KB	1000	248k	832001-1080000
6	132KB	1000	264k	1080001-1344000

*: 512B/SECTOR

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		STORAGE ADDRESS	MEANING OF INFORMATION	STORED DATA (LEADING STORAGE DEVICE, AMOUNT OF DATA, NEXT STORAGE ADDRESS)
INITIALIZED AREA	120	0	End	(0, 0, 0)
		1	Stream(1)	^① (0, 0, 0) ^③ →(1080001, 284000, 19) ^⑤ →(1, 184000, 20)
		2	Stream(2)	^① (0, 0, 0) ^② →(1, 184000, 18) ^④ →(0, 0, 0)
		3	Stream(3)	^① (0, 0, 0) ^② →(1080001, 256000, 22)
		4	Stream(4)	^① (0, 0, 0) ^⑤ →(300001, 84000, 21)
	151	5	Stream(5)	^① (0, 0, 0)
		6	Empty[1]	^① (1, 184000, 0) ^② →(0, 0, 0) ^④ →(1, 184000, 0) ^⑤ →(0, 0, 0)
		7	Empty[2]	^① (184001, 200000, 0) ^③ →(300001, 84000, 0) ^④ →(184001, 200000, 0) ^⑤ →(300001, 84000, 0) ^⑥ →(0, 0, 0)
		8	Empty[3]	^① (384001, 216000, 0) ^② →(0, 0, 0)
		9	Empty[4]	^① (600001, 232000, 0)
		10	Empty[5]	^① (832001, 248000, 0) ^③ →(876001, 204000, 0) ^⑤ →(832001, 248000, 0) ^⑦ →(876001, 204000, 0)
		11	Empty[6]	^① (1080001, 256000, 0) ^③ →(0, 0, 0) ^⑤ →(1080001, 256000, 0) ^⑦ →(0, 0, 0)
		12	Full[1]	^① (1, 0, 0) ^② →(1, 184000, 0) ^④ →(1, 0, 0) ^⑤ →(1, 184000, 0)
		13	Full[2]	^① (184001, 0, 0) ^③ →(184001, 116000, 0) ^④ →(184001, 0, 0) ^⑤ →(184001, 11600, 0) ^⑥ →(184001, 200000, 0)
		14	Full[3]	^① (384001, 0, 0) ^② →(384001, 216000, 0)
		15	Full[4]	^① (600001, 0, 0)
		16	Full[5]	^① (832001, 0, 0) ^③ →(832001, 44000, 0) ^⑤ →(832001, 0, 0) ^⑦ →(832001, 44000, 0)
		17	Full[6]	^① (1080001, 0, 0) ^③ →(1080001, 256000, 0) ^⑤ →(1080001, 84001, 0) ^⑦ →(1080001, 256000, 0)
EXTENSION AREA	152	18	Z ₁ →Z ₂	(184001, 0, 0) ^③ →(184001, 116000, 0)
		19	Z ₆ →Z ₅	(832001, 0, 0) ^③ →(832001, 44000, 0)
		20	Z ₁ →Z ₂	(184001, 0, 0) ^⑤ →(184001, 116000, 0)
		21	Z ₂ →Z ₃	(384001, 0, 0) ^② →(384001, 216000, 0)
		22	Z ₆ →Z ₅	(832001, 0, 0) ^② →(832001, 44000, 0)
		23		
		24		
		25		
		26		
		27		

FIG. 44

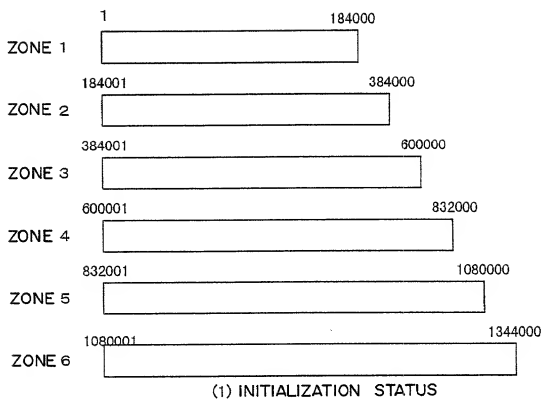


FIG. 45

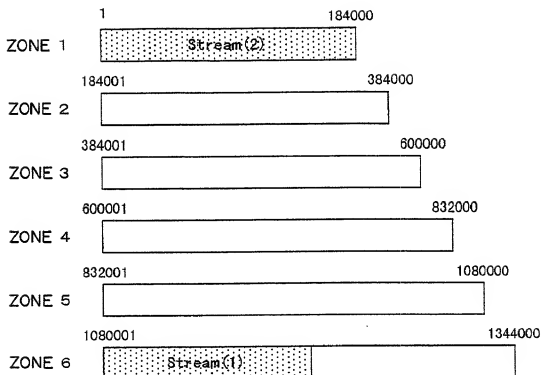


FIG. 46

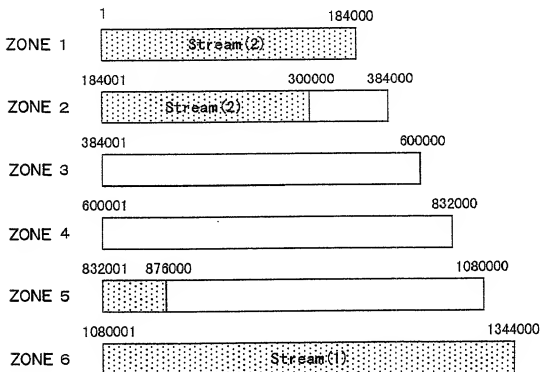


FIG. 47

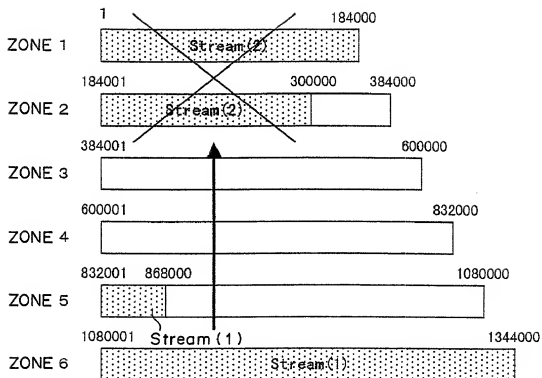


FIG. 48

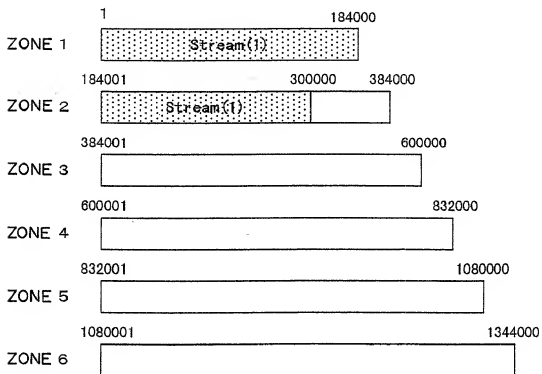


FIG. 49

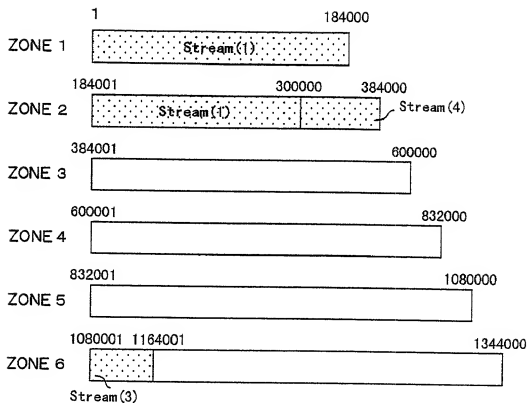


FIG. 50

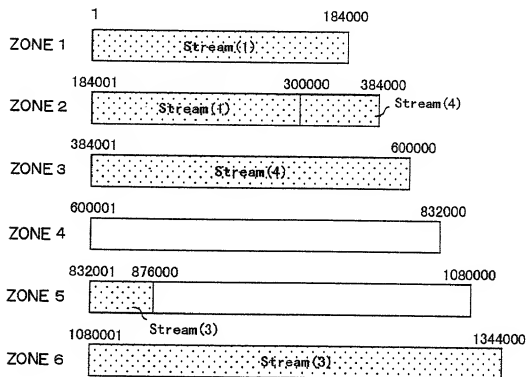


FIG. 51

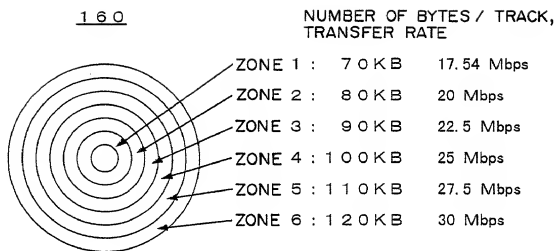


FIG. 52

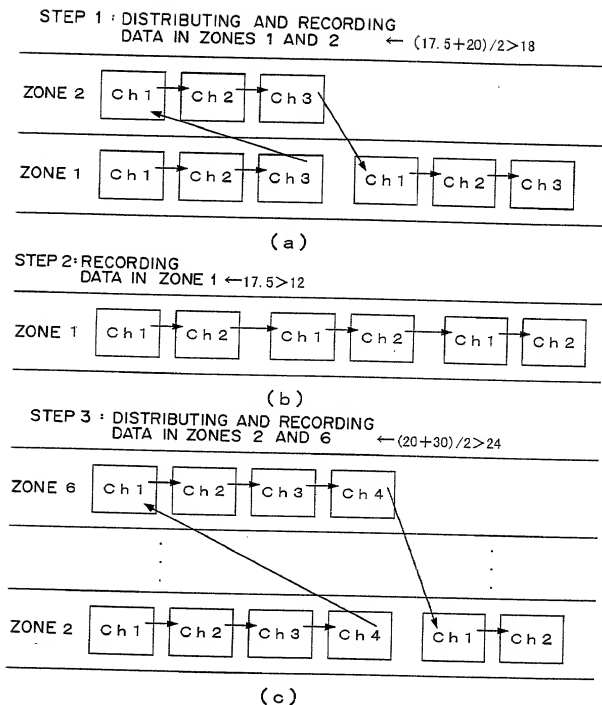


FIG. 53

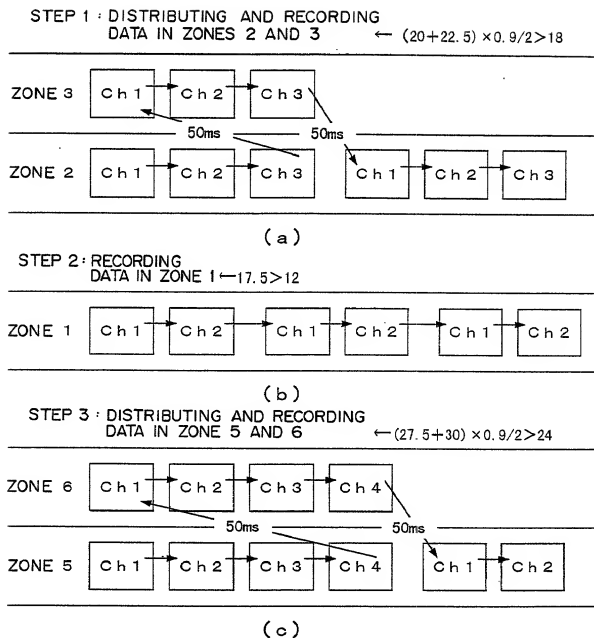


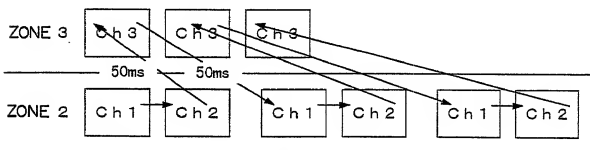
FIG. 54

STEP 1 : DISTRIBUTING AND RECORDING

DATA IN ZONES 2 AND 3

$$\leftarrow (20 + 2/3 + 22.5 \times 1/3) \times 0.9 > 18$$

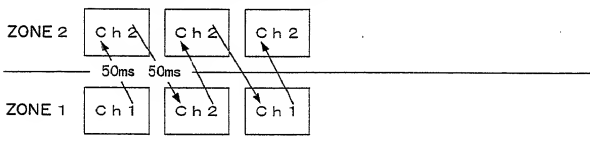
DISTRIBUTING DATA ALTERNATELY THROUGH 1ch AND 2ch



(a)

STEP 2 : RECORDING DATA
IN ZONES 1 AND 2

$$\leftarrow 17.5/2 + 20/2 \times 0.9 > 12$$

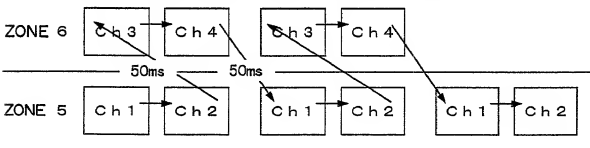


(b)

STEP 3 : DISTRIBUTING AND RECORDING
DATA IN ZONES 5 AND 6

$$\leftarrow (27.5 \times 2/4 + 30 \times 2/4) \times 0.9 > 24$$

ALTERNATELY DISTRIBUTING DATA IN TWO CHANNEL UNITS



(c)

FIG. 55

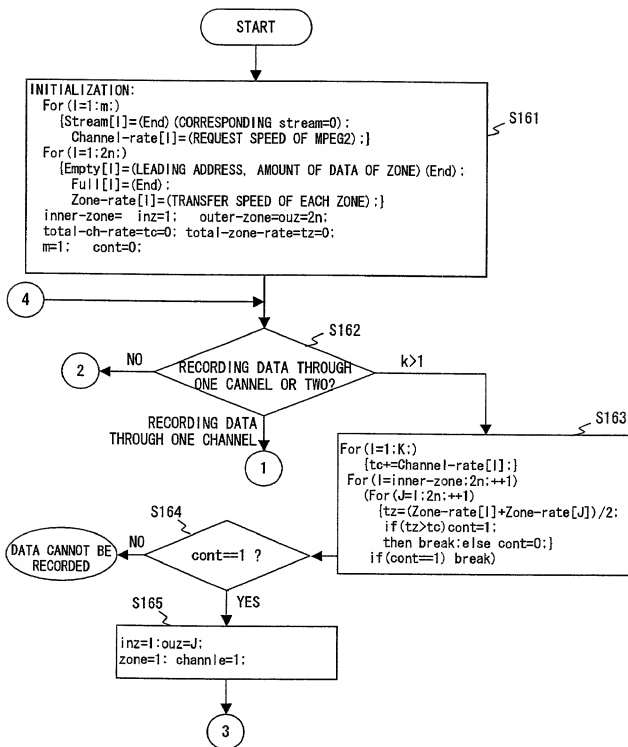


FIG. 56

```

graph TD
    3((3)) --> S166[S166]
    S166 --> S167[RECORDING ONE BLOCK THROUGH CHANNEL(channel) IN ZONE I ACCORDING TO LIST OF Empty[I]:  
ADDING LIST OF ONE BLOCK OF Empty[I] TO Stream(channel):  
Empty[I]=(TRAILING ADDRESS+1, AMOUNT OF REMAINING DATA) (End):  
Full[I]=(LEADING ADDRESS, AMOUNT OF RECORDED DATA) (End):  
channel++]
    S167 --> S168{channel > K?}
    S168 -- NO --> S166
    S168 -- YES --> S169[channel=1:]
    S169 --> S170{HAS DATA OF LIST AREA OF Empty[I] BEEN COMPLETELY RECORDED?}
    S170 -- NO --> S167
    S170 -- YES --> S171[Empty[I]=(End):  
Full[I]=(LEADING ADDRESS, AMOUNT OF ZONE) (End):  
I=I+1:]
    S171 --> S172{HAS DATA COMPLETELY BEEN RECORDED?}
    S172 -- NO --> S167
    S172 -- YES --> S173[inner-zone=I:]
    S173 --> 4((4))
    
    S174[S174] --> S175[RECORDING ONE BLOCK THROUGH CHANNEL(channel) IN ZONE J ACCORDING TO LIST OF Empty[J]:  
ADDING LIST OF ONE BLOCK OF Empty[J] TO Stream(channel):  
Empty[J]=(TRAILING ADDRESS+1, AMOUNT OF REMAINING DATA) (End):  
Full[J]=(LEADING ADDRESS, AMOUNT OF RECORDED DATA) (End):  
channel++]
    S175 --> S176{channel > K?}
    S176 -- NO --> S174
    S176 -- YES --> S177[channel=1:]
    S177 --> S178{HAS DATA OF LIST AREA OF Empty[J] BEEN COMPLETELY RECORDED?}
    S178 -- NO --> S175
    S178 -- YES --> S179[Empty[J]=(End):  
Full[J]=(LEADING ADDRESS, AMOUNT OF ZONE) (End):  
J=J+1:]
    S179 --> S180{HAS DATA COMPLETELY BEEN RECORDED?}
    S180 -- NO --> S175
    S180 -- YES --> S181[outer-zone=J:]
    S181 --> 4
  
```

FIG. 57

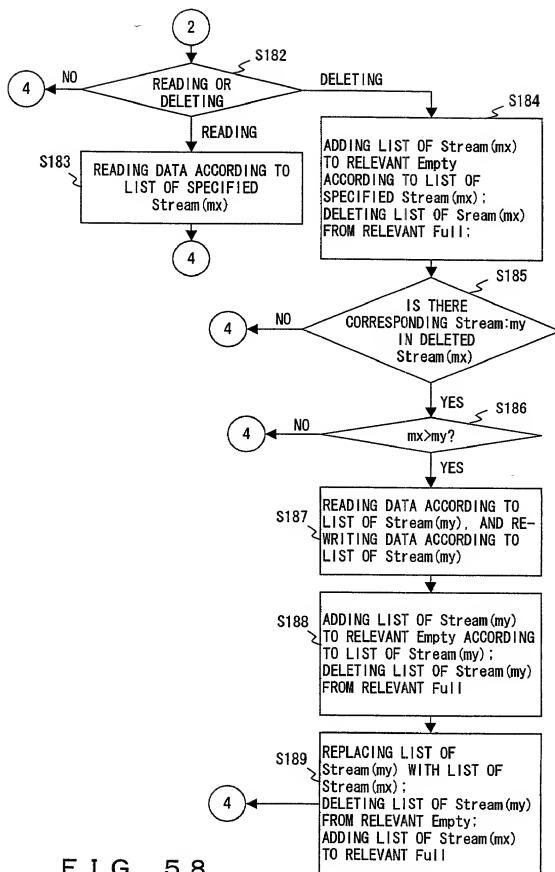


FIG. 58

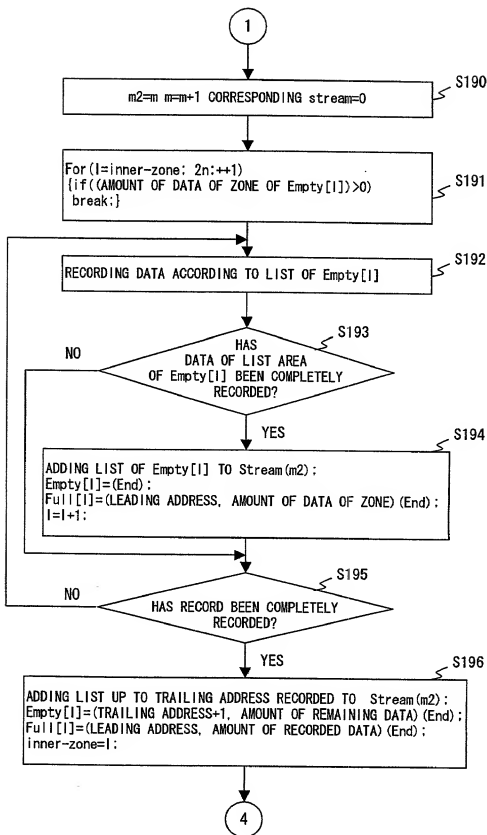


FIG. 59

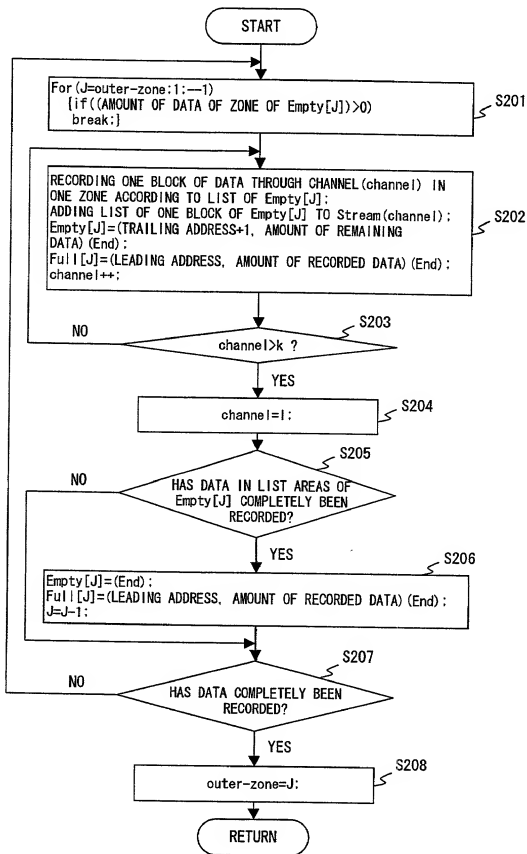


FIG. 60